Jan. 31, 1939. J. A. ROOK ET AL 2,145,634

ELECTRIC CONTROL FOR WARNING SIGNALS

Filed Nov. 25, 1935

Fig. 1.

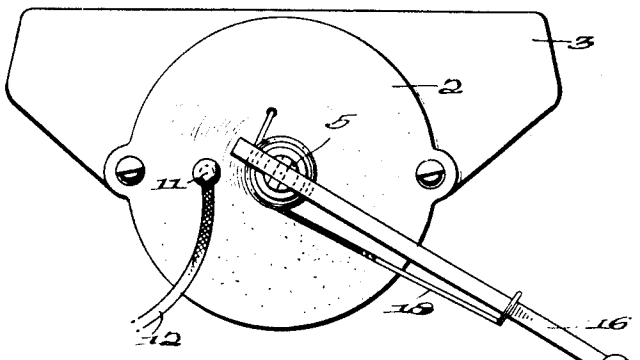
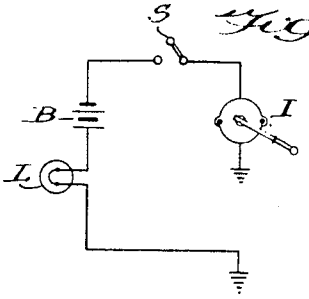


Fig. 5.



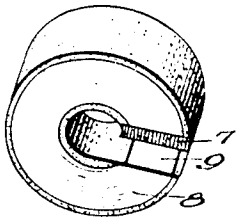


Fig. 2.

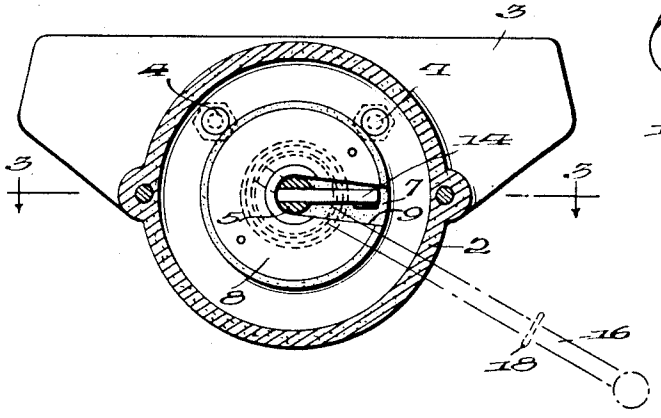
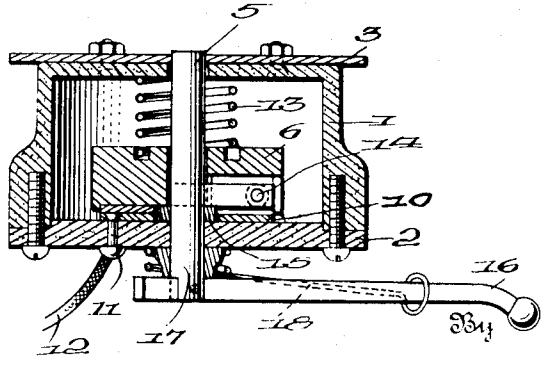


Fig. 3.



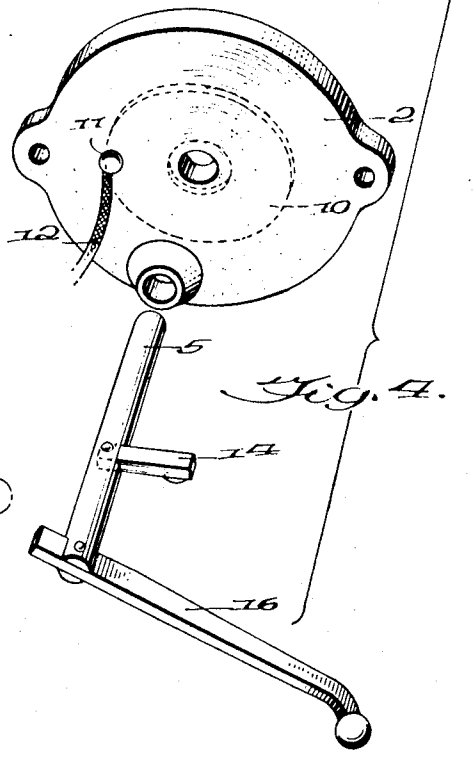


Fig. 4.

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ELECTRIC CONTROL FOR WARNING SIGNALS

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Application November 25, 1935, Serial No. 51,511

11 Claims. (Cl. 200—59)

This invention relates to electric controls for warning signals and the object of the invention is to provide a signal for an automobile which will indicate instantly any deceleration in the speed of the automobile.

Another object of the invention is the provision of an electric control in which any change in direction of rotation of a rotating element will instantly operate the control.

Another object of the invention is the provision of an electric control having a rotating contact plate in which the circuit may be completed at any point in its plane of rotation.

Another object of the invention is the provision of a carburetor feed valve control operated signal for automobiles which will automatically and instantly indicate any throttling of the valve.

Still another object of the invention is the provision of a simple and economical electrical signal and control therefor which is positive in operation and noiseless in action.

We accomplish the above, and other objects of the invention which will be apparent as the description proceeds, by means of the construction shown in the accompanying drawing, in which—

Figure 1 is a front elevation of the device constituting our invention;

Figure 2 is a view with the cover removed, the casing and shaft being shown in section and the operating lever in dotted lines;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is an exploded perspective of the operating lever, cover plate and rotating contact ring; and

Figure 5 is a diagram of an electric circuit, including our invention.

On the drawing, in which like reference characters indicate like parts on all the views thereof, 1 indicates a casing having a cover plate 2 of suitable insulating material. An attaching plate 3 is secured to the base of the casing by screws 4, or it may be soldered or welded thereto. It is apparent that this attaching plate might also be formed integral with the base of the casing, if desired.

The operating shaft 5, which extends into the casing through the cover plate, has loosely mounted thereon a block of insulating material 6 provided with a recess 7 in the outer face thereof. Secured to the block 6 and preferably embedded in the periphery thereof is a split ring 8 of metal or other suitable conductive material One end of the ring 8 terminates at the edge of the recess 7, while the other end is bent into the recess as shown at 9 to form a contact face. The opposed wall of the recess, as is apparent, constitutes a non-contact face.

To the inner face of the cover plate 2 is secured a second ring of metal, or other conductive material, 10, the terminal 11 for the lead wire 12 being electrically connected therewith. The rings 8 and 10, which are maintained in frictional face to face contact with each other during the operation of the device by means of the spring 13, constitute one of the contact elements of the electric control which constitutes our invention.

Secured to the shaft 5 is the cooperating contact which comprises the metal contact arm 14, which is of such size that it may be received in the recess 7 and have limited movement therein, moving from a position where it contacts with the contact face of the recess, to complete the circuit, to a position where it contacts the non-contact face of the recess. It is apparent that the circuit will be broken the instant that the contact arm 14 moves away from the contact face 9. In order to prevent the arm 14 from accidentally contacting the ring 10 and thus completing the circuit, an insulating bushing 15 is provided on the shaft 5 between the arm 14 and the ring 10.

At the outer end of the shaft, exterior of the casing, is secured the lever arm 16 which is connected to the control arm of the fuel feed valve of the carburetor, either directly or to the foot throttle rod, so that any movement of the fuel feed valve will be communicated to the shaft 5 through the lever arm 16. The bushing 17 and spring 18 are designed to hold the lever arm in proper relation to the fuel feed valve control.

The casing 1 is designed to be mounted on the engine of the automobile or other suitable metal part of the machine to ground the same, but it is apparent that it might be mounted elsewhere and a suitable ground wire provided.

In Figure 5 is shown a suitable circuit which includes the casing 1, a battery B, a signal lamp L and a switch S between the battery and the casing.

Operation

Operation of the carburetor fuel feed valve to increase the speed of the engine will rotate the shaft 5 in an anticlockwise direction, moving the waiting metal contact arm 14 in the recess 7 against the non-contact face and, since the block 6 is loose on the shaft, it will rotate with the arm against the friction of the spring 13. When the speed of the engine is decreased through throttling movement of the fuel feed valve control, the control arm 14 will be rotated in clockwise direc-

tion into abutting engagement with the contact face 9 of the ring 8. It will thus be seen that the circuit will then be completed through the rings 8 and 10 and the signal will be given.

It is to be noted that, since the spring 13 holds the rings 8 and 10 in frictional face to face engagement with each other, they can only be moved relatively to each other by the positive operation of the contact arm 14 and there is therefore no possibility that such relative motion might occur accidentally which would complete the circuit independently of the action of the contact arm.

While we have described our device as intended for an automobile warning signal, it is apparent that it is adapted for use in any connection where it is desired to complete a circuit upon the operation of a movable member in one direction and break it when the member is moved in the opposite direction. Instances of such use include internal combustion engines, aeroplanes, and power transmissions.

It is to be noted especially that, in contradistinction to the conventional multiple contact devices wherein the circuit is completed and broken at fixed points only, we have designed a device wherein the circuit can be completed at an infinite number of points located in a circular path defined by the contacting faces of the conductive rings 8 and 10.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A control for a warning signal comprising a rotatable shaft and mounting means therefor, a conductive ring loosely mounted on said shaft, a second conductive ring cooperating with said first named conductive ring, said rings being movable relatively to each other, means for holding said rings in frictional engagement with each other, one of said rings having an angular portion, an electric circuit, said rings and said shaft being in said circuit, a contact arm on said shaft, said contact arm being so constructed and arranged that it will rotate with the shaft in one direction to engage said angular ring portion to complete the circuit.

2. A control for a warning signal comprising a rotatable shaft and mounting means therefor, a conductive ring, said shaft extending through said ring, an insulating member having a recess therein loosely mounted on said shaft, a conductive ring carried by said member and having a portion extending into said recess, means for holding said rings in frictional engagement with each other, a contact arm secured to said shaft and positioned in said recess, the construction being such that rotation of the shaft in one direction will move the arm and the insulating member against the action of the ring holding means, and rotation of the shaft in the opposite direction will move the arm into contact with the portion of the ring located in the recess.

3. In an electric control, a fixed insulating plate, a rotatable shaft journalled in said plate, a conductive ring supported by said insulating plate, a block of insulating material loosely mounted on said shaft, a second conductive ring supported by said insulating block, said rings being in facial engagement with each other and of substantially the same extent, a contact arm on said shaft constructed and arranged to engage for rotating said insulating block and rotate the same and to engage said conducting ring thereon, and means for rotating said shaft and said contact arm.

4. An electric control comprising a metal casing, an insulated cover therefor, a shaft journalled in said cover and extending into said casing, an insulated member loosely mounted on said shaft within the casing, said member having a recess, a metal ring secured to said insulated cover, a metal ring secured to said insulated member and in facial engagement with said first named ring and having a portion extending into said recess to form a contact face, a contact arm on said shaft of less width than the width of the recess, said arm being rotatable by said shaft from a position where it is in engagement with said contact face to a position where it engages the insulating member, and means for rotating said shaft.

5. An electric control comprising a casing, a shaft extending into said casing, an insulating member mounted on said shaft, a second insulating member, said shaft passing through said second insulating member, a conducting element carried by each of said members, said conducting elements having frictional engagement with each other, one of said members having a recess into which a portion of the conducting element carried by said member extends to form a contact arm, said members being relatively rotatable, a contact arm on said shaft operating in said recess, said last named contact arm being constructed and arranged to engage the portion of the conducting element located in said recess, and means whereby said shaft may be rotated.

6. A normally open electric circuit, a shaft, bearings for said shaft, means for closing said circuit, said means including a pair of disks, conductors carried by each of said disks, means for maintaining said conductors in constant frictional engagement with each other but permitting one to rotate relatively to the other, said shaft passing through said disks, said circuit closing means also including a contact on one of said disks and a contact carried by the shaft.

7. A normally open electric circuit, a shaft, bearings for said shaft, means for closing said circuit, said means including a pair of disks, conductors carried by said disks, means for maintaining said disks and said conductors in constant frictional engagement with each other but permitting one to rotate relatively to the other, said shaft passing through said disks, said circuit closing means also including a contact on said relatively rotatable disk and a contact carried by said shaft, said relatively rotatable disk being free on said shaft, the parts being so constructed and arranged that when the shaft is rotated in one direction the contact thereon will be moved out of contact with the contact on the disk.

8. The device as defined in claim 7 and having means on said shaft for rotating the relatively rotatable disk, said last named means comprising an element arranged to engage the contact on said disk.

9. A normally open electric circuit, including a contact, a shaft, bearings for said shaft, means for closing said circuit, said means including a pair of disks at all times in frictional engagement with each other, said shaft passing through said disks, a conductor carried by each of said disks, one of said disks being rotatable relatively to the other disk, a contact on said relatively rotatable disk in circuit with its conductor, means on said shaft for engaging said relatively rotatable disk to rotate the same, the parts being so constructed and arranged that when the shaft is

rotated in one direction the means on said shaft will engage the relatively rotatable disk whereby the circuit contact and the disk contact will be brought into engagement with each to close the circuit through the conductors.

10. A normally open circuit including a contact, a shaft and mounting means therefor, means for closing the circuit, said means including a pair of disks, conductors in said circuit carried by said disks, friction producing means, said friction producing means maintaining said disks in constant frictional engagement with each other but permitting one to rotate relatively to the other, said shaft passing through said disks, said relatively rotatable disk having a contact in circuit with its conductor, means carried by said shaft for rotating said relatively rotatable disk, the parts being so constructed and arranged that when the shaft is rotated in one direction the means on said shaft will engage the relatively rotatable disk to rotate the same and move the contacts into engagement with each other and remain in such position while the shaft continues to rotate in the same direction.

11. In an electric control, a contact element comprising a stationary member and a relatively rotatable member, each of said members having a conductive face, one of said members having a non-conductive face, means for holding the conductive faces of said members in frictional engagement with each other during every position of said rotatable member, a rotatable contact element operative to bear against said non-conductive face to rotate said rotatable member, said contact element being also operative to move independently of said rotatable member to bear against the conductive portion thereof, and means for rotating said contact element.

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